

**WHAT IS CLAIMED IS:**

1. An optical subscriber network system comprising:  
a server bi-directional optical transmitter including  
5 a multiplexer to multiplexes communication data and broadcast data,  
a server laser diode to converts the multiplexed data into an optical  
signal, and  
a server photo diode receive communication data from a subscriber,  
wherein the server bi-directional optical transmitter transmits the  
10 upstream communication data; and  
a subscriber bi-directional optical receiver including  
a subscriber laser diode to transmit upstream communication data,  
a subscriber photo diode to receive the optical signal transmitted from the  
server bi-directional optical transmitter, and  
15 a demultiplexer to demultiplex and divide the multiplexed signal into  
communication data and broadcast data.
2. The optical subscriber network system as claimed in claim 1, wherein the  
multiplexer and demultiplexer are a time division multiplexer and demultiplexer,  
20 respectively.

3. The optical subscriber network system as claimed in claim 2, wherein the communication data is received from a server computer.

4. The optical subscriber network system as claimed in claim 1, wherein the server bi-directional optical transmitter transmits the upstream communication data to the server computer.

5. The optical subscriber network system as claimed in claim 1, wherein the subscriber bi-directional optical receiver providing the communication data divided by the TDDM to a subscriber-side computer.

6. The optical subscriber network system as claimed in claim 6, wherein the subscriber bi-directional optical receiver comprises:

an Ethernet switch configured to (1) switch the communication data transmitted from the demultiplexer to a subscriber computer, and (2) receive the communication data transmitted from the subscriber computer;

a third PHY coupled to the demultiplexer to convert the communication data with a MII type into a TX signal; and

a fourth PHY to convert the TX signal into a MII signal for the Ethernet switch, and to convert a MII signal from the Ethernet switch into a TX signal for the subscriber laser diode,

wherein, the TX signal output from the fourth PHY is used to operate the third

PHY.

7. The optical subscriber network system as claimed in claim 5, wherein the server bi-directional optical transmitter comprises:

5 a first PHY to convert the communication data received by the server photo diode into a MII signal; and

an Ethernet switch to transmit the MII signal to the server computer and provide the communication data from the server computer to the multiplexer.

10 8. The optical subscriber network system as claimed in claim 5, wherein the subscriber bi-directional optical receiver comprises:

an Ethernet switch to (1) switch the communication data from the demultiplexer to a subscriber-side computer, and (2) receive the communication data from the subscriber computer; and

15 a third PHY coupled to the demultiplexer to convert the communication data with a MII type into a TX signal for the Ethernet switch, and convert a MII signal from the Ethernet switch into a TX signal for the subscriber laser diode,

wherein, the TX signal from the Ethernet switch is used to operate the third PHY.

20 9. The optical subscriber network system as claimed in claim 5, wherein the first PHY converts a 100 Base-T optical fiber signal into a MII signal, and the second PHY converts a MII signal into a MLT-3 signal.

10. The optical subscriber network system as claimed in claim 5, wherein the TDM inserts a plurality of broadcast data streams and communication data into time slots and generates time slot frames.